



Off-Campus Partnerships: Forensic Toxicology and Forensic Science Masters Degrees

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Executive Director, CFSRE

Program Director, Thomas Jefferson University PSM in Forensic Toxicology

About our Non-Profit



THE FREDRIC RIEDERS FAMILY FOUNDATION

- **The Center for Forensic Science Research and Education at the Fredric Rieders Family Foundation**
 - *Willow Grove, PA*
 - *Dedicated to Forensic Science Education, Research and Mentorship*



www.frfoundation.org

CFSRE Purpose and Mission



Our Purpose

The Center aims to promote forensic science and its values to the public and the scientific community at large through outreach activities including participation with public, private, government, academic and non-profit groups, providing lectures, presentations, science based demonstrations and activities, and supplying resource materials to promote awareness of the contributions of forensic science to civil society.

The Center offers educational program in partnership with academic institutions to offer forensic science graduate and undergraduate education.

The Center promotes lifelong professional development and learning for forensic scientists by offering internships, continuing professional courses, webinars, and other training opportunities.

Our Mission

To improve the best practices of forensic science and promote the field's advancement by providing leadership, conducting meaningful research and providing high quality education and training programs for students, practitioners and the law enforcement and legal communities.

The American Academy of Forensic Sciences

- Founded in 1948
- Total Membership = 6,649
 - Criminalistics = 2,690
 - Digital = 100
 - Engineering = 150
 - General = 821
 - Jurisprudence = 213
 - Odontology = 401
 - Pathology = 900
 - Physical Anthropology = 522
 - Psychiatry = 142
 - Questioned Documents = 197
 - Toxicology = 513



Forensic Science Mentorship

- Forensic Science Mentoring Institute
- G John DiGregorio Summer Science Program for High School Students.
- 8 weeks of laboratory-based forensic technology instruction and forensic case applications.
- Mock case and mock trial preparation.



Forensic Science Continuing Education

- **Online and In-Person Courses**

- Online

- Forensic Toxicology Instrumentation Techniques and Applications
- Toxicology Board Certification Preparation
- Forensic Pharmacology
- Synthetic Cannabinoids/Opioids: Public Health and Public Safety Challenges

- Face-to-Face

- RF Borkenstein Drug Course
- Postmortem Toxicology
- Topics in Human Identification



RESOURCES RESEARCH PROJECTS CONTINUING EDUCATION GRADUATE PROGRAMS

Forensic Courses and Workshops

www.forensicscienceeducation.org

Forensic Science Research



- Over 15 ongoing projects including:
- LCQTOF Identification of Designer Drugs and *In Vitro* Metabolic profiling of Novel Psychoactive Substances (NPS) at Rave Events
- Pharmacoepidemiology using LCQTOF datamining for Novel Opioids
- Marijuana, Other Drugs and Driving
- Development of Mass Spectrometry-Based Tests for Determination of Origin of Biological Fluids Stains.
- Development of Novel Techniques for Recovery of DNA from Bullets, Shell Casings and Pipe Bombs.



Article

Analysis of Novel Synthetic Opioids U-47700, U-50488 and Furanyl Fentanyl by LC–MS/MS in Postmortem Casework

Amanda L. A. Mohr¹, Melissa Friscia¹, Donna Papsun², Sherri L. Kacinko², David Buzby², and Barry K. Logan^{1,2,*}

¹The Center for Forensic Science Research and Education (CFSRE), 2300 Stratford Ave, Willow Grove, PA 19090, USA, and ²NMS Labs, 2300 Welsh Rd, Willow Grove, PA 19090, USA



Differences in state drug testing and reporting by driver type in U.S. fatal traffic crashes



Megan E. Slater^{a,*}, I-Jen P. Castle^a, Barry K. Logan^b, Ralph W. Hingson^c

^aCSR, Incorporated, 4250 Fairfax Drive, Suite 500, Arlington, VA 22203, United States
^bNMS Labs, 3701 Welsh Road, Willow Grove, PA 19090, United States
^cNational Institute on Alcohol Abuse and Alcoholism, 5625 Fishers Ln, Rockville, MD 20852, United States

Article

Impact of Expanding ELISA Screening in DUID Investigations to Include Carisoprodol/ Meprobamate and Zolpidem

Aileen Lu^{1,2}, Karen S. Scott^{1,2}, Aya Chan-Hosokawa³, and Barry K. Logan^{1,2,3,*}

¹Arcadia University, Department of Chemistry, 450 S. Easton Road, Glenside, PA 19038, USA, ²Center for Forensic Science Research and Education, 2300 Stratford Avenue, Willow Grove, PA 1990, USA, and ³NMS Labs, 3701 Welsh Road, Willow Grove, PA 19090, USA

Identification and Prevalence Determination of Novel Recreational Drugs and Discovery of Their Metabolites in Blood, Urine, and Oral Fluid

Award Number: 2013-DN-BX-K018

Amanda L.A. Mohr, Melissa Friscia, Barry K. Logan



INVITED REVIEW **aFP**

The Determination of Insulin Overdose in Postmortem Investigations

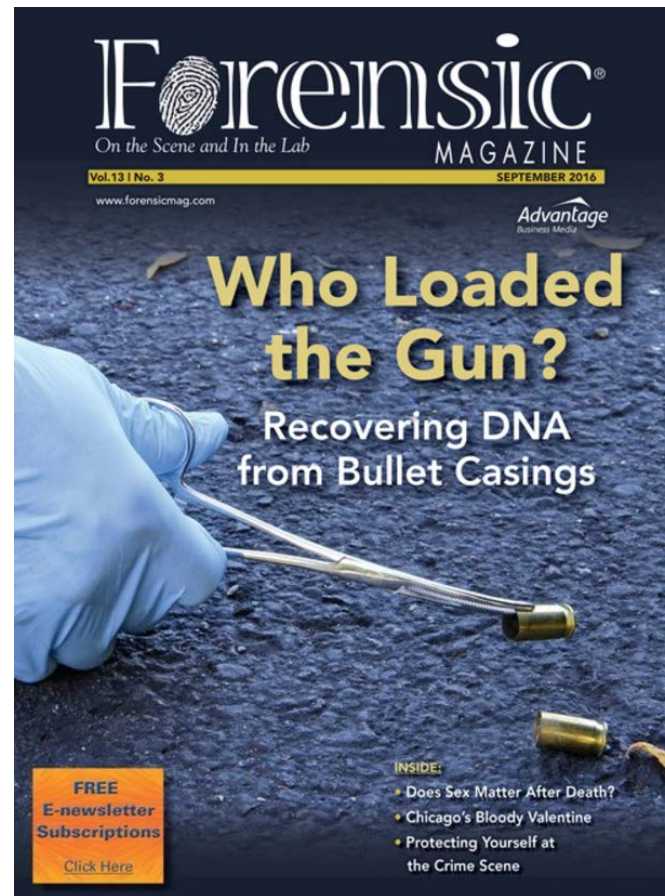
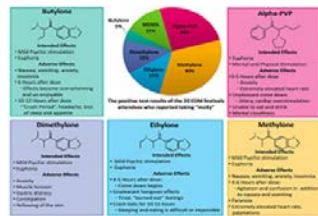
Laura M. Labay, Casey P. Bitting, Kevin M. Legg, Barry K. Logan



Recreational Research: Analyzing 'designer drugs' at Miami's premier electronic music festival

Tue, 10/20/2015 - 1:10pm by Jim Dawson, NIJ

When toxicologist Barry Logan brought his research team to Miami's Ultra Music Festival in 2014 to gather data on designer drugs, he used a straightforward approach to convince attendees to provide saliva, urine and blood samples: he asked them if they wanted to help science. Electronic dance music festivals have a long-standing reputation for attracting young people who use designer drugs or as the *Miami Herald* wrote: "a smorgasbord of psychotropic uppers and downers." By focusing on electronic dance music festival attendees as a sampling population, Logan has gathered data that otherwise would be difficult to obtain.



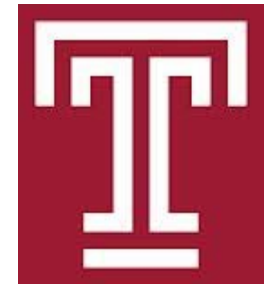
Who Loaded the Gun? Recovering DNA from Bullet Casings

Tue, 09/27/2016 - 11:32am by Jim Dawson



Forensic Science Graduate Education

- Masters of Science Degree Programs to improve technical capability, instrumental methods development, research, management skills, report writing and testimony skills, and more.
- Heavily Lab Based programs:
 - **Arcadia University** Masters of Science in Forensic Science (FEPAC Accredited)
 - **Thomas Jefferson University** Professional Masters of Science in Forensic Toxicology (A PSM® certified program)
 - **Temple University** Professional Science Masters in Forensic Chemistry.



Responsibilities and Obligations



- Recruitment
- Enrollment management
- Student Academic Advising
- Teaching non-forensic coursework
- Registrar Services
- Coordination of Academic Advisory Board (TJU)
- PSM/FEPAC

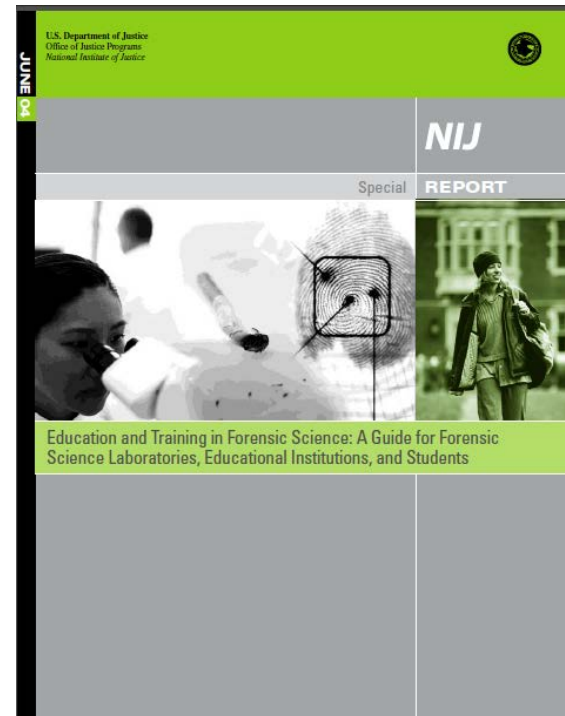


- Curriculum Design
- Recruitment Support
- Screening applicants
- Onboarding
- Teaching Forensic Coursework
- Research project assignment and advising
- Internship/Clerkship
- Professional integration

Forensic Science Education

TWGED

Graduate degree. Graduate programs can move students from theoretical concepts to discipline-specific knowledge. Exemplary curriculums can include such topics as crime scenes, physical evidence, law/science interface, ethics, and quality assurance to complement the student's advanced coursework. Graduate programs should be designed with strong laboratory and research components. Access to instructional laboratories with research-specific facilities, equipment, and instrumentation and interaction with forensic laboratories are required to enhance the graduate-level experience. By emphasizing written and oral communication and report

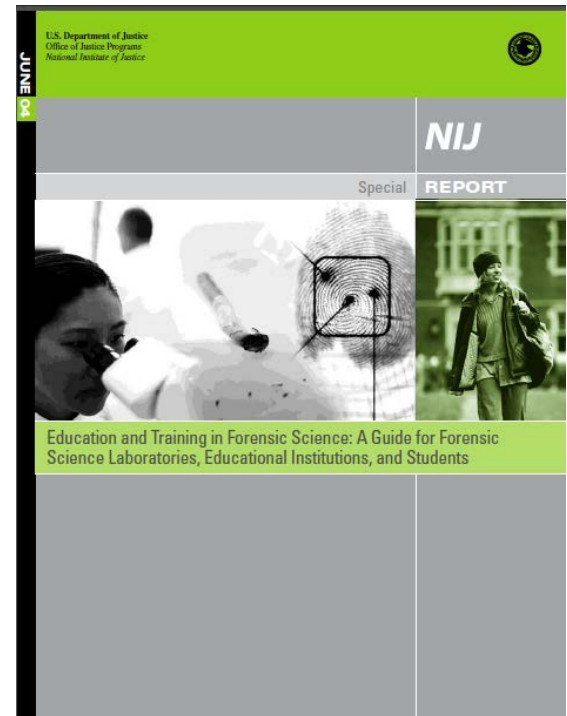


Forensic Science Education

TWGED

Research component

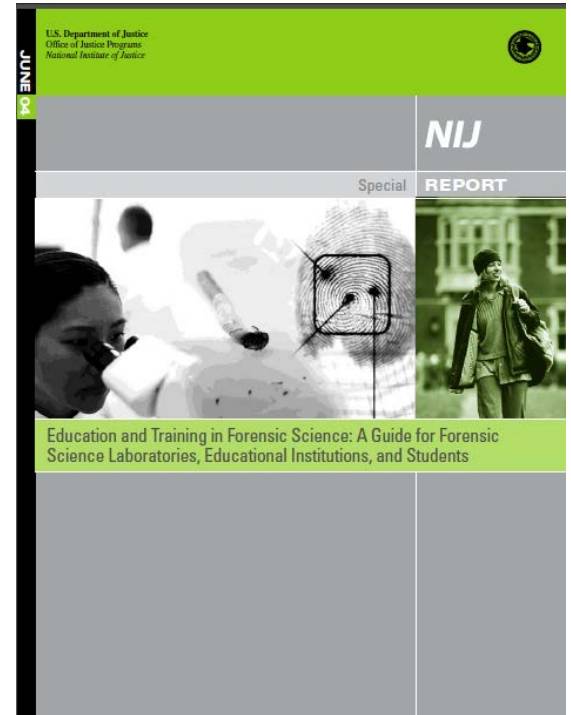
The student is expected to conduct a research project, prepare a written report, and present the results of the research in a public forum prior to graduation. The research component of the program may include preparatory coursework in research methods and statistics. The ideal research project is well defined, stands a reasonable chance of completion in the time available, and requires the student to use advanced concepts and a variety of experimental techniques and instruments. Research in forensic science advances the body of knowledge and elevates the status of the profession.



Forensic Science Education

Professional Skills for Forensic Scientists (TWGED).

- Critical Thinking, Quantitative Reasoning and Problem Solving
- Decision Making
- Good Laboratory Practices
- Awareness of Laboratory Safety
- Observation and Attention to Detail
- Public Speaking
- Oral and Written Communication
- Time Management
- Prioritization of Tasks



Forensic Science Graduate Education

- **Arcadia University**
- **Masters of Science in Forensic Science.**
- Accredited by FEPAC
 - Multidisciplinary
 - Defined Curriculum – No electives
 - Final Semester Track Select Internship/Research
- Generalist Forensic Science Content
- 48 Credit, 2 year full time program
- Best suited to students with a general interest in forensic science, but no specific discipline commitment.



Forensic Science Graduate Education

- **Thomas Jefferson University**
- **Professional Science Masters™ in Forensic Toxicology**
- Recognized by the Kech Graduate Institute
 - Forensic Toxicology Focus
 - Mix of Science and Business/Management Courses with multiple Elective Options
 - Final Semester Track Select Internship/Research
- 36 Credit, 2 year program
- Best suited to students with a specific interest in analytical/forensic toxicology, career track development, part time possible



The Professional Science Masters (PSM) Degree

- PSM™ vs FEPAC
 - FEPAC Accreditation
 - Requirements include comprehensive curriculum,
 - Crime scene investigation, Physical evidence concepts, Law/science interface, Ethics and professional responsibilities, Quality assurance Analytical chemistry and instrumental methods of analysis, Drug chemistry/toxicology, Microscopy and materials analysis, Forensic biology, Pattern evidence
 - Research, Internship and Capstone



Internships

12 participants from:
Penn State, Chestnut Hill
College, University of Illinois,
Boston University, Arizona
State, University of Florida,
Towson, St. Lucia

TOP-NOTCH INTERNSHIPS

Janelle Leo '17, forensic biology, and Andrew Wong '17, molecular biology, interned at the Center for Forensic Science and Education at the National Medical Services Lab in Willow Grove, Pa., during the summer, where they spent up to 40 hours per week combining classroom work with laboratory experience.

Wong chose molecular biology because of the broad foundation he would get on his way to becoming a forensic DNA scientist. Wong also chose CHC for its size and environment and has found so much more than he expected.

Leo explains for both: "We used instrumentation and analytical tests performed in actual forensic laboratories while processing our own mock casework. We gained experience following standard operating procedures, running instrumentation and conducting data analysis. The internship concluded with a courtroom-based mock trial where we served as expert witnesses and attorneys conducted direct and cross examination. The main focus was for us to be able to recognize forensic evidence at crime scenes and understand its potential value for analysis to generate information for case investigation."

Leo chose CHC specifically for its forensic biology program and loves the friendly atmosphere, small campus and science faculty. "They are great to work with and explain everything thoroughly so you know how to do your job," she says, and adds that she plans to enroll at Arcadia University to earn a master's degree in forensic science.



Seniors Janelle Leo and Andrew Wong collect DNA from a beer bottle found at a crime scene.

"If CHC had a graduate program [in forensics], I would stay."

"This internship helped me confirm for myself that I've made the right choices," she adds. "And the more I move forward, the more I confirm that this is what I want to do."

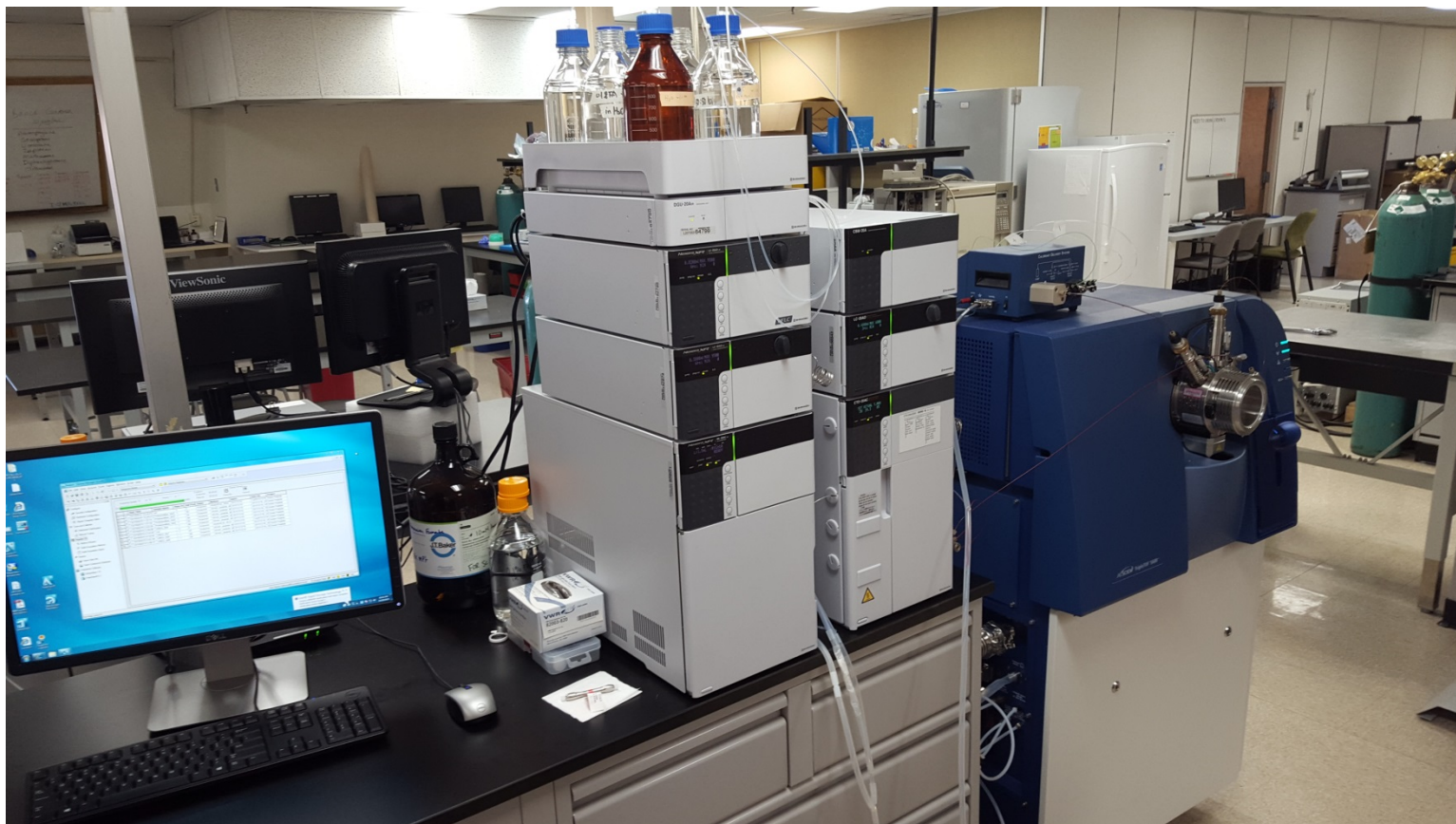
"I sensed Janelle's overwhelming enthusiasm for her internship experience," says Kulkosky, who credits Leo with opening a door at the center that presents a major opportunity for future students. 🐾



Teaching Facilities



Research



Moot Court



Industry Partner



- **NMS Labs**

- Material Support of CFSRE
 - Leadership release
 - Instrumentation
 - Technical Support
 - Project Advisors
- Internships
- Employee Tuition Reimbursement
- Employment

Operational Insights

- **Positive Drivers**

- Outreach by both institutions for recruitment
- Plug-and-Play deep Subject Matter expertise
- Compatible academic goals
- Research capabilities and track record
- Builds from existing adjunct relationships
- Complementary assets to support the program
- Alumni relationships
- True partnership from recruitment through graduation
- Coordinated scheduling and proximity

Operational Insights

- Landmines

- Skepticism from the Academic Community
- Lack of true engagement and collaboration
- Vendor/Client mentality
- Lack of academic perspective by the partner
- Financial Expectations and Contracting
- Lack of consultation on admissions
- Lack of understanding by the Institution of the Specialty
- Matching academic timelines with other commitments

Questions and Discussion

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